

**Engineering Analysis
SSAB Alabama Inc.
(503-8065)**

Introduction

On March 15, 2009, the Department received an Air Permit Application from SSAB Alabama Inc., for a new vacuum tank degasser operation to be located at SSAB Alabama Inc., in Axis, Alabama. Additional information was received on April 15, 2009, May 8, 2009, and June 16, 2009. The VTD process improves steel quality by removing hydrogen and nitrogen from the liquid steel. The proposed operation would consist of a vacuum tank degasser, an electrode steam generator, inline maintenance air filter, slag rake, hotwell condenser system, and a wire feed system with baghouse. The proposed VTD process does not include oxygen lancing or steel decarburization which generates high concentrations of carbon monoxide (CO). The proposed system would be located inside an extension to the existing mill building.

The VTD process begins by placing a ladle of molten steel in the tank vessel fitted with a lid. An inert gas (argon) is introduced into the vessel to stir the steel during degassing. The tank vessel is then put under vacuum using a steam ejector system. The steam is produced by an electrode steam generator. The steam generator would produce no emissions of air pollutants. The impurities, such as hydrogen and nitrogen, are pulled into the steam ejector system which would include an inline dry filter to remove particulates. The fumes from the ladle would then combine with the steam from the ejectors. The steam would then be condensed into water and discharged into a hot well for reuse. The process gas would be compressed to atmospheric pressure by 3 ring pumps and vented to the atmosphere. A wire feed system would be used to feed material through the roof of the tank into the molten steel to achieve the desired chemistry. Emissions from the wire feed process are exhausted by a small fume collection system with a baghouse which would be vented inside the building. The wire feeding process would be done when the system is not under vacuum. Some fugitive emissions would result from raking slag, argon stirring, and the occasional charging of flux material prior to a ladle's placement under vacuum.

Emissions

Potential emissions from degassing and wire feeding were based on manufacturer's data, potential throughput, and potential operation of 8760 hours per year. Potential fugitive emissions from slag raking were based on AP-42 emission factors.

Emission Point	Emission Source	Potential PM Emissions
VTD-01	Degassing	0.009 lb/hr (0.04 TPY)
VTD-02	Wire Feeding	0.235 lb/hr (1.03 TPY)
FUG	Fugitives	0.046 lb/hr (0.20 TPY)
Total		0.29 lb/hr (1.27 TPY)

Since the emissions are vented inside the building, actual emission would be below the above estimated potential emissions.

ADEM Admin.Code R. 335-3-4-.04

ADEM Admin. Code 335-3-4-.04 assigns the proposed wire feeding process a total allowable particulate matter emission rate of 2.48 lbs/hr (10.87 TPY). Emissions from the proposed wire feeding process would be well below the allowable emission rate. Furthermore, SSAB has requested to limit PM emissions from the Wire Feed Baghouse to 1.0 lb/hr.

PSD/Title V

The facility is a major source with regard to Title V and PSD. The potential to emit for PM₁₀ would be less than the PSD significance threshold of 15 TPY. SSAB is considered a major source for Title V, and currently holds a Major Source Operating Permit (MSOP). SSAB must apply to have any permitted units included into their MSOP within twelve months of start-up.

NSPS/NESHAP/112(g)/Air Toxics

There are no New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants applicable to this operation. Air Toxics are not expected to be emitted in significant quantities, so an Air Toxics review would not be necessary. This facility is located more than 100 km from any Class I area. Emissions from the proposed project are not expected to significantly impact any Class I area.

Recommendations

Pending the outcome of a 15-day public comment period, I recommend issuing Air Permit No. 503-8065-X009 for the Vacuum Tank Degassing Operation.

Charles Killebrew
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Air Division

June 17, 2009
Date